RIVERS AND FLOODS

[River and Flood Division, MERRILL BERNARD in charge]

By BENNETT SWENSON

Atlantic slope drainage.—Light flooding continued from January and February into March in most of the rivers from South Carolina southward. Continued rain and slow run-off over the Santee Basin in South Carolina resulted in stages near or slightly above flood stage during the entire month.

Rains on the 15th and again on the 20th caused further rises in the Savannah and Altamaha systems in South Carolina and Georgia. Flood stage was only slightly exceeded at a few points on these rivers.

No damage of consequence resulted from the flooding in this region.

East Gulf of Mexico drainage.—Most of the rivers in this area continued slightly above flood stage from the previous month. No further losses were reported as a result of this continuation of high water.

Moderately heavy to heavy rains occurred on the 19th and 20th and again on the 24th and 25th over most of the drainage area. As a result of these rains minor floods occurred in the Apalachicola, Alabama, Tombigbee, and Pear rivers during the latter part of March. As these floods followed higher stages during January and February no further losses of consequence were incurred.

Upper Mississippi drainage.—High temperatures prevailed during the first week of March in this region. Thawing resulted in the streams in Iowa, and northern Illinois that were already swollen and choked with ice following the floods of the latter part of February and flooding again resulted in these streams. The Mississippi River went slightly above flood stage from Keithsburg, Ill., to Grafton, Ill., on March 7 to 17.

Considerable damage resulted at some points from these floods during February and March but reports of all the losses are not available at this time. The losses from the sudden floods which occurred during February in the southern and eastern portions of Wisconsin are estimated at about $200,000. A gorge formed at the mouth of the Skunk River in Iowa in February and resulted in the flooding of about 10,000 acres of lowland south of Burlington, Iowa, but no great amount of damage occurred. The flood in the Illinois River was light and there was no property loss.

Missouri River drainage.—Some flooding occurred in most of the tributaries of the Missouri in Iowa early in March as a result of the spring break-up of the ice. An ice gorge formed just below Akron, Iowa, on the Big Sioux River on March 7, and a stage of 13.0 feet was reached on March 10 but no damage occurred. On March 12 an ice gorge formed 4 miles above the mouth of the Big Sioux and the ice was blocked for a distance of 8 or 9 miles upstream, resulting in considerable overflowing but no damage of consequence resulted.

The Grand River in Missouri had a moderate flood on March 4 to 7, in the upper reaches. The flood was rather strong in the vicinity of Chillicothe, Mo., due to run-off from melting ice and snow but little damage was reported. The total loss in the Grand River flood is estimated at about $3,400.

Ohio River Drainage.—Flood stage was exceeded during the month only at Anderson, Ind., on the West Fork of White River, where the stage reached was only 0.6 foot above flood stage on March 25–26.

Red River Drainage.—High water continued in the Black River from February into March and a crest of 55.8 feet was reached at Jonesville, La., on March 4 to 7. The stage was still above flood at the close of the month.

Minor floods occurred in the Sulphur River in Texas during the month but losses were small.

Lower Mississippi drainage.—There was a gradual recession of the high water of the January-February flood during March. The Yazoo River remained above flood stage at Yazoo City, Miss., until March 31. The last station on the lower Mississippi River proper to pass below flood stage was Baton Rouge, La., on March 23.

High water also continued in the Atchafalaya River, and at Atchafalaya, La., the river was still above flood stage at the close of the month.

West Gulf of Mexico drainage.—Light flooding occurred in the Trinity and Guadalupe Rivers. No losses were reported.

Colorado River drainage.—A series of moderate floods in the lower Gila River between Gila Bend and Yuma, Ariz., caused total estimated damages of about $8,000. The greatest damage occurred at the time of the high water on the 27th and 28th, especially damage to crops. Gage heights are not available as the Bureau does not maintain stations on that portion of the river.

Pacific Slope drainage.—The rivers in the Sacramento and San Joaquin Basins were swollen from frequent rains in February and the first half of March. Heavy precipitation during the third week of March caused further rises in the streams. Flood stage, however, was exceeded only in the Cosumnes-Mokelumne River section. The crest stage, 14.4 feet on March 23, at Bensons Ferry, Calif., on the Mokelumne River, was within a tenth of a foot of the highest stage of record at that place.

The following report on the floods in this area was received from the Sacramento, Calif., office:

Frequent rains during February and the first half of March kept the streams of the Sacramento and San Joaquin systems swollen. During the third week in March a series of storms moving from the ocean inland over northern California brought exceptionally heavy precipitation to the region from the Mokelumne River northward to Mount Shasta, mostly in the form of snow above the 2,500-foot level. For this reason, the area of effective run-off was limited to the foothills, while an unusually heavy snow cover accumulated in the Sierra down to intermediate elevations, which are usually bare at this season of the year. Had the precipitation been rain to high levels, as is usual in spring storms, a major flood would have resulted in the valley streams.

As it was, a serious flood condition occurred only in the Cosumnes-Mokelumne River section, where the flood crest, as indicated by the river station at Bensons Ferry on March 23, was 14.4 feet, or 2.4 feet above the flood stage; the highest of record is 14.5 feet in 1907 and also in 1911.

As the water from the upper Mokelumne was mostly going into storage in Pardee Dam, the flood was caused mainly by the output of the Cosumnes River, Dry Creek, and other local drains from the foothills. Several thousand acres of land along the left bank of the Mokelumne River, between the Cosumnes River and Dry Creek, were under water. But as it was mostly grazing land, the resultant damage in that section was almost negligible.

Bear Creek in San Joaquin County flooded a large acreage in the Lodi district, causing considerable damage locally to crops and farm property, and some livestock were drowned.

On the Sacramento River the stage was near the flood level in the vicinity of Knights Landing, Calif., for several days, and the water pouring over the nearly 2-mile long Fremont Weir caused increasingly high water in the Yolo Bypass region, and on March 23, the Little Holland tract, comprising about 2,800 acres of grain

and sugar-beet land, was flooded. No other reclaimed land in the Yolo Basin was inundated.

The losses incurred in the Sacramento Basin are estimated at about $45,000, mostly to prospective crops. The figures for the estimated losses in the San Joaquin Basin flood are not available at this time but will be reported in a later issue of the REVIEW.

CORRECTIONS FOR FEBRUARY 1937 REVIEW, PAGE 86, TABLE OF FLOOD STAGES

Date of crest at Yazoo City, Miss., "Feb. 24" should be "Feb. 24, Mar. 1."

Dates above flood stage: Greenville, Miss. "To Mar. 8" should be "To Mar. 12." Vicksburg, Miss., "To Mar. 15" should be "To Mar. 14."

Table of flood stages during March 1937

[All dates in March unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	Feet			*Feet*	
Peedee: Mars Bluff Bridge, S. C	17	Feb. 24	1	17.6	Feb. 26, 27
Santee:					
Rimini, S. C	12	Dec. 31	(1)	18.8	Feb. 10
				13.6	28
Ferguson, S. C	12	Jan. 1	(1)	14.2	Jan. 10, 11
Savannah:					
		Jan. 16	5	21.2	Feb. 13
Ellenton, S. C	14	12	13	14.2	13
		17	30	17.3	19
				16.6	Feb. 18
Clyo, Ga	13	Jan. 26	9	16.0	2
Ogeechee: Dover, Ga	7	3	5	7.2	4
		Feb. 27	3	12.1	1
Ocmulgee: Abbeville, Ga	11	24	29	11.9	27
Altamaha:					
		Jan. 28	9	15.9	Feb. 22
Charlotte, Ga	12			15.7	3, 4
		22	(1)	14.8	29, 30
Everett City, Ga	10	Feb. 22	11	10.8	Feb. 26
EAST GULF OF MEXICO DRAINAGE					
		Jan. 21	8	19.5	Feb. 26
Apalachicola: Blountstown, Fla	15	22	(1)	19.9	25
Cahaba: Centerville, Ala	23	20	21	28.6	20
Alabama: Millers Ferry, Ala	40	24	26	42.2	25
Tombigbee:					
Lock No. 4, Demopolis, Ala	39	22	26	41.6	24
		Jan. 2	1	57.9	Feb. 2
Lock No. 3	33	21	31	43.9	25
Lock No. 2	46	25	26	46.1	25
		Jan. 5	2	40.2	Feb. 4–6
Lock No. 1	31	23	(1)	34.3	27
Pearl:					
		Feb. 25	5	21.0	1
Jackson, Miss	18	27	29	18.2	28
		Feb. 26	15	12.8	Feb. 28
Pearl River, La	12	24	(1)	13.2	27

Table of flood stages during March 1937—Continued

[All dates in March unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
	Feet			*Feet*	
Rock: Moline, Ill	10	Feb. 21	18	14.7	6
Cedar: Cedar Rapids, Iowa	13	9	9	13.7	9
Iowa:					
Iowa City, Iowa	8	3	16	14.6	7
Wapello, Iowa	10	6	15	14.6	8
Skunk: Augusta, Iowa	15	7	7	15.1	7
		12	12	15.5	12
Raccoon: Van Meter, Iowa	13	4	4	14.0	4
		6	6	14.0	6
Des Moines:					
Tracy, Iowa	14	4	10	17.9	5
Ottumwa, Iowa	9	5	10	14.7	6
Illinois:					
Havana, Ill	14	Feb. 22	5	14.7	Feb. 26
Beardstown, Ill	14	Feb. 23	6	15.1	Feb. 27, 28
Mississippi:					
Keithsburg, Ill	12	8	13	13.2	10
Keokuk, Iowa	12	7	15	16.1	10
Quincy, Ill	14	7	16	18.2	11
Hannibal, Mo	13	7	17	17.8	12
Grafton, Ill	18	14	16	18.2	15
Missouri Basin					
Grand:					
Gallatin, Mo	20	4	5	22.8	5
Chillicothe, Mo	18	4	7	25.2	5
Big Sioux: Akron, Iowa	12	7	[2] 10	13.0	10
Ohio Basin					
West Fork of White: Anderson, Ind	8	5	9	8.0	5–9
		21	31	8.6	25, 26
Red Basin					
Black: Jonesville, La	50	Feb. 9	(1)	55.8	4–7
Sulphur:					
		5	9	22.7	5
Ringo Crossing, Tex	20	15	15	21.1	15
		24	27	22.6	24
		8	20	25.8	11
Naples, Tex	22	26	(1)	26.6	29
Lower Mississippi Basin					
Yazoo: Yazoo City, Miss	29	Jan. 29	31	37.1	Feb. 24, 1
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La	22	Jan. 22	(1)	25.9	7–9
WEST GULF OF MEXICO DRAINAGE					
Trinity: Liberty, Tex	24	16	18	24.3	17, 18
Guadalupe: Victoria, Tex	21	8	9	22.4	9
PACIFIC SLOPE DRAINAGE					
San Joaquin Basin					
Mokelumne: Bensons Ferry, Calif	12	22	24	14.4	23

[1] Continued into April. [2] Fell slightly below flood stage on 9th.

WEATHER ON THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, I. R. TANNEHILL in charge]

NORTH ATLANTIC OCEAN, MARCH 1937

By H. C. HUNTER

Atmospheric pressure.—The northeastern and north-central portions of the North Atlantic had much higher pressure averages than normal; so that the Iceland region had about as high averages as any part of the ocean area, and the chief low-pressure region was far to the southeastward, near the southern parts of the British Isles and the North Sea. At Horta the pressure averaged moderately below normal, and the Azores high likewise had moved southeastward to the Madeira-Canaries region. As for western portions, pressure was somewhat below normal near the Gulf of St. Lawrence and for considerable distances to southward and southeastward; but the departures decreased to southwestward, so that for the Gulf of Mexico as a whole pressure was near normal.

The extremes of pressure indicated by vessel reports are 30.53 and 28.45 inches. The higher reading was noted on the Italian steamship *Ida Z. O.*, on the forenoon of the 17th, near 33° N., 42° W. Reykjavik, Iceland, on the 8th had slightly greater pressure, as table 1 shows. The lower reading was made on the American liner *Manhattan*, early on the 15th, near 48° N., 32° W.